

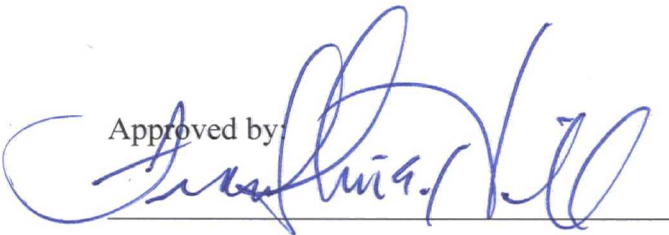
**Third Five-Year Review Report
for
Wingate Road Municipal Incinerator Dump
FLD981021470**

**Fort Lauderdale
Broward County, Florida**

September 2016

United States Environmental Protection Agency
Region 4
Atlanta, Georgia

Approved by:

A handwritten signature in blue ink, appearing to read "Franklin E. Hill", is written over a horizontal line.

Franklin E. Hill, Director
Superfund Division

Date:

9/14/2016



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**Third Five-Year Review Report
for
Wingate Road Municipal Incinerator Dump
1300 NW 31st Avenue
Fort Lauderdale
Broward County, Florida**

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
BHHRA	Baseline Human Health Risk Assessment
BLM	Biotic Ligand Model
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FYR	Five-Year Review
GCTL	Groundwater Cleanup Target Level
HQ	Hazard Quotient
IC	Institutional Control
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
mg/kg	Milligram per Kilogram
mg/L	Milligram per Liter
µg/L	Microgram per Liter
ng/kg	Nanogram per Kilogram
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SCTL	Soil Cleanup Target Level
TBC	To-Be-Considered
TEF	Toxicity Equivalent Factor
TEQ	Toxicity Equivalence

Executive Summary

The 61-acre Wingate Road Municipal Incinerator Dump Superfund site (the Site) is located in Fort Lauderdale, Broward County, Florida. From 1954 to 1978, the City of Fort Lauderdale (the City) operated two waste incinerators, offices and a 40-acre disposal area on site. Disposal practices on site included landfilling of residential wastes, industrial wastes and incinerator residues. In addition, the City discharged cooling water from the incinerators into a cooling water percolation pond and periodically removed ash from the pond and placed it in the landfill or around the banks of the pond. Waste disposal activities contaminated site soil, groundwater, surface water and sediment with metals, dioxin and several semi-volatile organic compounds.

The U.S. Environmental Protection Agency designated a single operable unit (OU) to address soil, groundwater, surface water and sediment contamination at the Site. The final remedy selected in the 1996 Record of Decision (ROD) – and revised by Explanations of Significant Differences (ESDs) in 1997 and 2000 – included excavation of soil and sediment and its placement in a capped landfill, and monitoring of groundwater, surface water and fish tissue. The triggering action for this five-year review (FYR) was the signing of the previous FYR on June 21, 2011.

The Site's remedy is protective of human health and the environment. Landfill cap construction is complete and required institutional controls are in place to restrict land use and groundwater use. The remedial action objective (RAO) of reducing Site risks to health-based levels and protecting the surficial aquifer system beyond the current site boundary have been met.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Wingate Road Municipal Incinerator Dump		
EPA ID: FLD981021470		
Region: 4	State: FL	City/County: Fort Lauderdale/Broward
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA If "Other Federal Agency" selected above, enter Agency name: Click here to enter text.		
Author name: Pam Scully (EPA), Kirby Webster (Skeo) and Claire Marcussen (Skeo)		
Review period: September 2015 – September 2016		
Date of site inspection: September 23, 2015		
Type of review: Statutory		
Review number: 3		
Triggering action date: June 21, 2011		
Due date (five years after triggering action date): June 21, 2016		

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:

OU1

Sitewide Protectiveness Statement

Protectiveness Determination:

Protective

Protectiveness Statement:

The Site's remedy is protective of human health and the environment. Landfill cap construction is complete and required institutional controls are in place to restrict land use and groundwater use. The RAO of reducing Site risks to health-based levels and protecting the surficial aquifer system beyond the current site boundary have been met.

Environmental Indicators

- Current human exposures at the Site are under control.
- Current groundwater migration is under control.

Are Necessary Institutional Controls in Place?

☒ All ☐ Some ☐ None

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?

☒ Yes ☐ No

Has the Site Been Put into Reuse?

☐ Yes ☒ No

Third Five-Year Review Report for Wingate Road Municipal Incinerator Dump

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the Wingate Road Municipal Incinerator Dump Superfund site (the Site) in Fort Lauderdale, Broward County, Florida. The EPA's contractor conducted this FYR from September 2015 to June 2016. The EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. The Florida Department of Environmental Protection (FDEP), as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to the EPA during the FYR process.

This is the third FYR for the Site. The triggering action for this statutory review is the signature date of the previous FYR. The FYR is required because hazardous substances, pollutants or

contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit (OU).

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
The City of Fort Lauderdale purchased the site property	1951
The City of Fort Lauderdale operated two municipal incinerators and a landfill	1954 – June 1978
The EPA discovered contamination at the Site	May 1, 1982
The EPA completed site inspection	March 31, 1986
The EPA completed a preliminary assessment	December 21, 1987
The EPA proposed for listing on the Superfund program's National Priorities List (NPL)	June 24, 1988
The EPA listed the Site on the NPL	October 4, 1989
The EPA issued an Administrative Order on Consent requiring the PRP to conduct a remedial investigation/feasibility study (RI/FS) for remaining soil, sediment and surface water contamination PRP initiated the RI/FS	September 27, 1991
PRP completed RI/FS completed The EPA issued the Site's Record of Decision (ROD)	May 14, 1996
The EPA signed an Explanation of Significant Differences (ESD) changing cap construction material and required on-site treatment or off-site disposal of dioxin soils from the old incinerator building	November 10, 1997
The EPA and PRP entered into a Consent Decree for the PRP to complete remedial design and remedial action The PRP began the remedial design	December 28, 1999
The EPA signed a second ESD to clarify an issue related to the initial cleanup plan, update cleanup goals for soil and groundwater, and add monitoring goals for surface water and fish tissue	May 16, 2000
PRP completed remedial design for debris removal and began remedial action	August 28, 2000
PRP completed remedial design for demolition activities	November 20, 2000
The PRP completed remedial design for final capping	May 29, 2001
The EPA finalized the Site's Preliminary Close-Out Report for remedy construction completion	January 4, 2002
FDEP began removal of dioxin-contaminated soil on 17 residential properties	January 23, 2002
FDEP completed residential removal of dioxin-contaminated soil	April 4, 2002
The PRP began operation and maintenance (O&M) activities	August 1, 2002
PRP completed the remedial action for disposal, demolition and capping	August 5, 2003
The EPA signed the Site's first FYR	December 21, 2005
The EPA designated the Site as Sitewide Ready for Anticipated Use	June 26, 2006
The EPA signed the Site's second FYR	June 21, 2011

3.0 Background

3.1 Physical Characteristics

The 61-acre Site is located at 1300 NW 31st Avenue in a populated area of Fort Lauderdale, Broward County, Florida (Figure 1). NW 31st Avenue borders the Site to the west. A vacant property, which historically was a privately owned metal recycling operation, borders the Site to the north. A privately-owned recreational lake known as Rock Pit Lake, which historically received overflow from the cooling water pond, borders the Site to the northeast. Rock Pit Lake is not currently used recreationally. Residential properties border the Site to the east and south.

The northern portion of the Site includes a capped landfill that is covered in grass and has a maximum elevation of about 41 feet above mean sea level, about 30 feet above the surrounding grade. The 20-acre southern portion of the property was historically referred to as the Process Area. It included (prior to demolition activities) two inactive incinerator buildings, cooling water treatment structures, a vehicle maintenance area, other various buildings and a cooling water percolation pond, known as Lake Stupid. The cooling water percolation pond was excavated and sediment was placed under the landfill cap before construction of what is now the wet retention area, located in the southeastern corner of the Site (Figure 2). There are dry and wet stormwater retention features around the perimeter of the landfill, and larger retention areas on the south end of the landfill. An unpaved road surrounds the landfill, and the entire Site is surrounded by a fence.

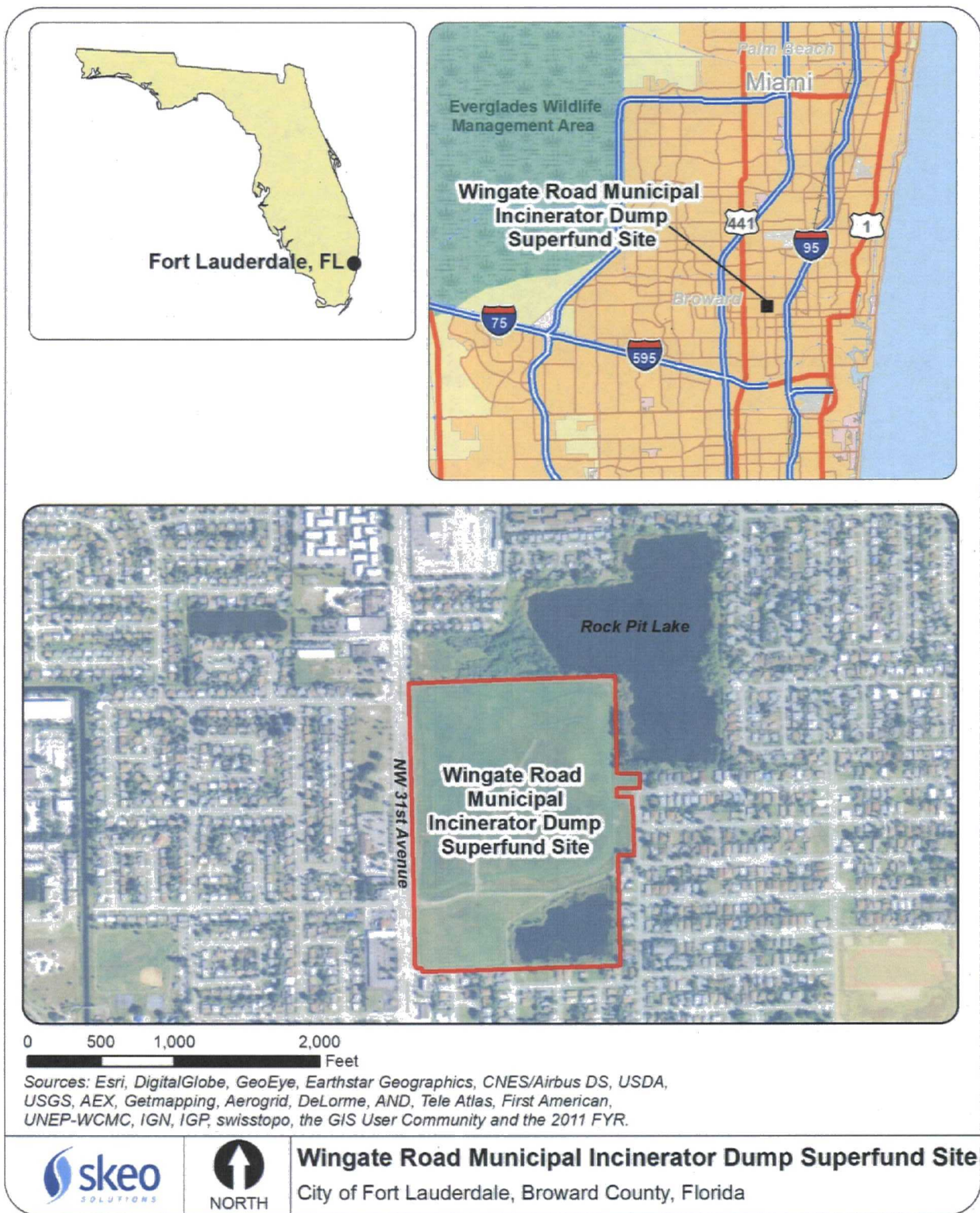
Surface drainage on site is controlled by site topography and drainage features. Precipitation that falls on the landfill is routed through a stormwater management system to the wet retention area. It percolates from the area into the groundwater. The wet retention area and Rock Pit Lake are hydraulically connected to groundwater.

There are three hydrogeologic units at the Site – the Biscayne Aquifer, composed primarily of limestone and sand, the intermediate confining unit, composed of silty, sandy clays, and the Floridan Aquifer. The Biscayne Aquifer is the primary water-producing zone. The water in the Floridan Aquifer in the vicinity of the Site is highly mineralized and is not suitable for potable water supply. Groundwater within the Biscayne Aquifer generally flows toward the east and southeast. Local groundwater flow at the Site is influenced by the landfill topography. A slight mounding of the water table develops beneath the landfill, resulting in a radially-outward flow of groundwater. The mounding effect does not appear to influence the groundwater flow pattern beyond the Site.

3.2 Land and Resource Use

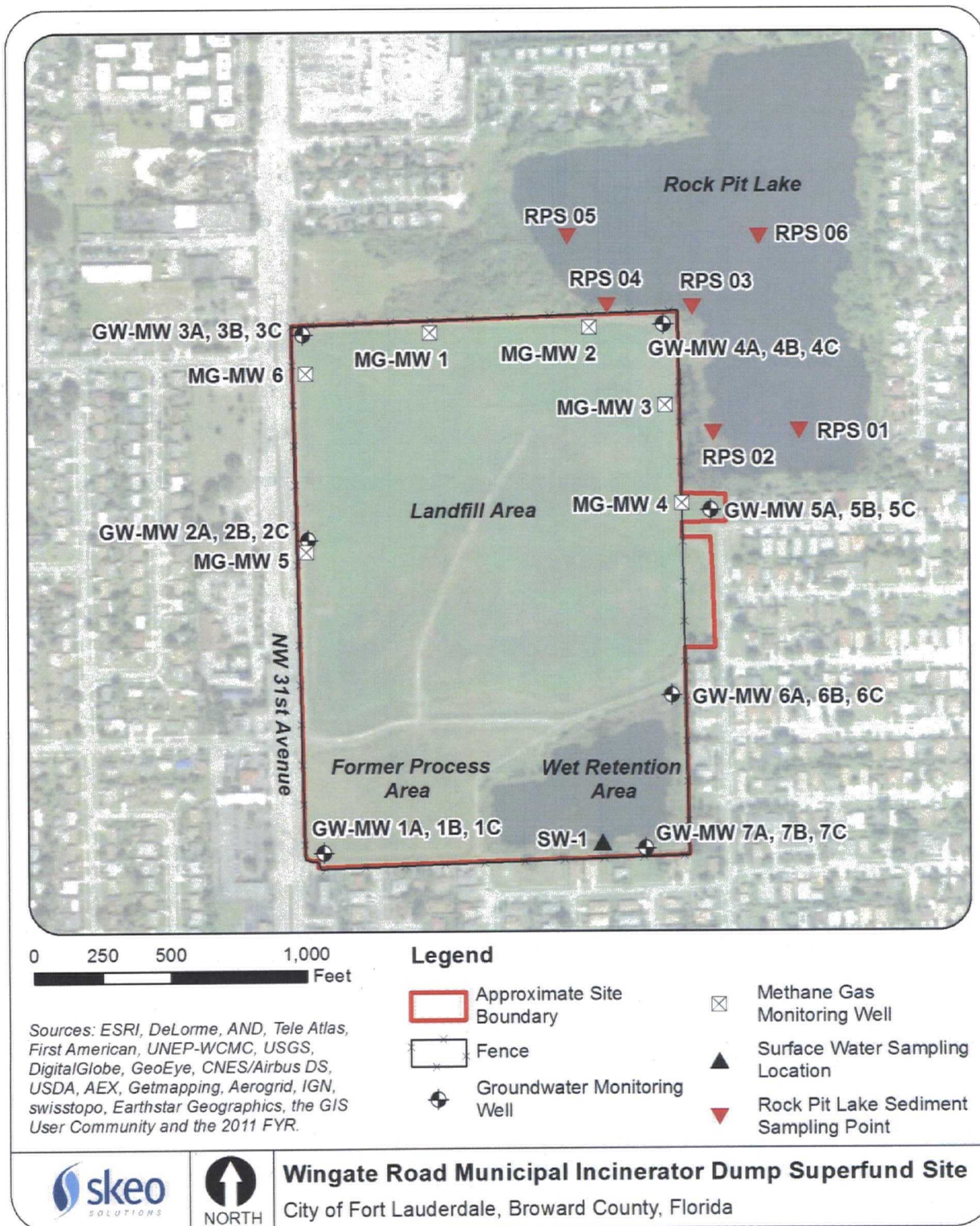
The City purchased the site property in 1951 and operated two municipal incinerators and a landfill from 1954 to June 1978. In 1966, the City also constructed a cooling water percolation pond. By 1975, the City had constructed a cooling water treatment system to remove ash from the cooling water before the water was discharged to the pond.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

As part of site cleanup, the City demolished site buildings and the incinerators. The Site is currently vacant and available for reuse. The Site is zoned for commercial and industrial land uses. Surrounding land uses are commercial (west and north of the Site) and residential (south and east of the Site). Groundwater at the Site is not used for human consumption or other purposes. Residents near the Site were connected to the public water supply. Groundwater use restrictions were placed on the Site. The Site qualified for the EPA's Sitewide Ready for Anticipated Use measure in 2006, signifying that construction of the remedy had been completed and all institutional controls, as applicable, had been put in place.

To date, no concrete actions have been taken toward reuse. Local stakeholders have discussed several possible site reuse options, including a golf course, a health clinic and a senior center.

3.3 History of Contamination

The City operated two municipal incinerators and a landfill from 1954 to June 1978. They processed about 480 tons of municipal solid waste per day. One incinerator was constructed in 1954, and a second incinerator was added in 1966. An ash cooling water pond was constructed in 1966. The pond lost permeability due to the buildup of fine ash. The City periodically removed the ash from the bottom of the pond and placed the ash in the landfill or around the banks of the pond. The pond was then connected to Rock Pit Lake by an overflow ditch along the eastern edge of the landfill. In 1975, the City constructed a cooling water treatment system to remove the ash from the cooling water before the water was discharged to the cooling water percolation pond. The resultant sludge from the water treatment system was disposed of in the landfill along with the ash from the incinerators. The City ceased incinerator and landfill operations at the Site in 1978. The Site's PRPs include the City of Fort Lauderdale, Waste Management and the Port Everglades Authority, as well as some small contributors that were settled with.

3.4 Initial Response

The EPA completed a site investigation in 1986. Results showed pesticides in surface and subsurface soil from the landfill area. Elevated pesticide concentrations were also reported in sediments from Rock Pit Lake. In 1986 the City began closure of the landfill in accordance with Florida Administrative Code (FAC) landfill closure requirements. The closure process was suspended when the site was added to the National Priorities List.

The EPA proposed the Site for inclusion on the Superfund program's National Priorities List (NPL) on June 24, 1988. The Site was finalized on the NPL on October 4, 1989. The closure of the landfill was delayed until completion of the remedial investigation/feasibility study (RI/FS). In 1991, the EPA entered into an Administrative Order on Consent with the City and the Port Everglades Authority requiring them to conduct the RI/FS.

3.5 Basis for Taking Action

The City performed an RI from August 1992 through September 1994. The results indicated that primary contaminants in the landfill, soils and ash residue were metals, benzo(a)pyrene and dioxin. Metals were detected above ambient water quality criteria in surface water samples from

the cooling water percolation pond and Rock Pit Lake, while sediments included metals, toxaphene and dioxin. The City also sampled fish from the cooling water percolation pond and Rock Pit Lake. Tissue samples indicated the presence of dioxin. Groundwater contaminants included several organic contaminants and metals.

The results of the baseline human health risk assessment (BHHRA) indicated that the primary contaminants contributing to cancer risks greater than 1×10^{-6} or noncancer hazards greater than 1.0 in soil, ash residue and sediment are benzo(a)pyrene, dioxin and metals. Hypothetical risks and noncancer hazards associated with exposure to groundwater were driven by bis(2-ethylhexyl) phthalate and metals. Off-site groundwater did not pose unacceptable risks or hazards.

A qualitative ecological evaluation indicated that metals in site soils in the southern portion of the Site and the landfill have the potential to impact invertebrates and small mammals. Dioxin could impact small mammals in the landfill area. Potential impacts to sensitive aquatic species in the cooling water percolation pond were also possible as a result of metals in lake water.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

The Site's 1996 Record of Decision (ROD) identified objectives for how the selected remedy will protect human health and the environment:

- Reduce the risks associated with exposure to contaminated media to health-based levels.
- Protect the surficial aquifer system beyond the current site boundary.

The major components of the selected remedy – based on the 1996 ROD, as revised by the Site's 1997 and 2000 Explanations of Significant Differences (ESDs) – include source control and groundwater remedial components:

- Construction of a geosynthetic membrane cap with erosion controls over the landfill.
- Excavation of contaminated soil and incinerator ash, with disposal in the landfill.
- Drainage, treatment and disposal of water in the wet retention area, previously Lake Stupid.
- Excavation of sediment from the wet retention area (Lake Stupid), with disposal in the landfill.
- Construction of a stormwater management system.
- Natural attenuation for the surface water at Rock Pit Lake.
- Decontamination (and/or demolition) of the incinerator buildings and water treatment structures.
- Institutional controls and/or groundwater use restrictions within the site boundary.
- Stormwater controls, fencing, signs and institutional controls for the maintenance of the site cap.
- Groundwater, surface water, sediment and fish tissue monitoring for up to 30 years.
- Treating 150 cubic yards of highly contaminated dioxin materials from the old incinerator building on site or disposing of the material off site.

The 1996 ROD identified performance goals in soil/ash residue, groundwater, surface water, sediment and fish tissue as the remedial goals for the Site. The 2000 ESD eliminated remedial goals for beryllium in soil and aluminum and manganese in groundwater as the goals were not needed for the protection of human health and the environment. Table 2 summarizes remedial goals for soil/ash residue and sediment. Table 3 summarizes the remedial goals for groundwater outside of the current site boundary and surface water. Table 4 summarizes the remedial goal for fish tissue.

Table 2: Summary of Remedial Goals for Soil, Ash Residue and Sediment

Contaminant of Concern (COC)	Remedial Goals ^{a,b} (mg/kg)	
	Soil/Ash Residue	Sediment
Metal COCs		
Antimony	NA	67
Arsenic	23	46
Cadmium	NA	170
Lead	500	NA
Organic COCs		
Benzo(a)pyrene	0.13	NA
Dioxin TEQs	0.0006	0.0013
Toxaphene	NA	1.8

Contaminant of Concern (COC)	Remedial Goals ^{a,b} (mg/kg)	
	Soil/Ash Residue	Sediment
<i>Notes:</i> a. Remedial goals obtained from Section A.2 of the 1996 ROD. b. Based on a residential exposure that falls within the 1×10^{-6} to 1×10^{-4} cancer risk range or noncancer hazard quotient (HQ) of 1.0. NA = not applicable; chemical not a COC for this medium. mg/kg = milligrams per kilogram TEQ = Toxicity Equivalence		

Table 3: Summary of Remedial Goals for Groundwater and Surface Water

COC	Remedial Goals ^a (µg/L)		
	Groundwater	Surface Water	
		Acute	Chronic
Metal COCs			
Aluminum	NA	750	87
Antimony	6	88	30
Cadmium	5	3.9	1.1
Beryllium	NA	NA	0.13
Copper	NA	19	13
Iron	NA	NA	1000
Inorganic COCs			
Lead	15	96	3.6
Mercury	2	2.4	0.012
Silver	NA	4.8	0.12
Zinc	NA	127	115
Organic COCs			
Benzene	1	NA	NA
Bis(2-ethylhexyl) phthalate	6	NA	NA
Notes:			
a. Remedial goals obtained from Section B.1 and C. of the 1996 ROD. Groundwater remedial goals are federal and/or state groundwater standards. Surface water criteria are based on acute and chronic ambient water quality criteria.			
NA = not applicable; chemical not a COC for this medium.			
µg/L = micrograms per liter			

Table 4: Remedial Goal for Fish Tissue

COC	Remedial Goals ^a (ng/kg)
Dioxin	0.02
a. Remedial goals obtained from Section D. of the 1996 ROD, calculated for human consumption. ng/kg = nanograms per kilogram	

4.2 Remedy Implementation

In May 1998, the EPA and the City signed a Consent Decree for remedy implementation. Substantial cleanup work was completed in October 2001. Minor elements of the remedy and remedy completion took place in 2003. The three phases of the remedial action were site clearing and debris cleanup, building and structure demolition, and landfill closure.

The PRPs implemented land use restrictions in August 2000 restricting the installation of groundwater drinking wells and the use of any groundwater drinking well at the Site. The restrictions also prohibit the use of the Site in any manner that would disturb the integrity of the final cover or any component of the containment system. Section 6.3 provides detailed information on the restrictions. Section 4.3 discusses operation and maintenance (O&M) activities, including methane monitoring and groundwater, surface water, sediment and fish tissue sampling and analysis. TASK Environmental, a consulting company, started these activities on the City's behalf in August 2002.

Site Clearing and Debris Removal

Work during this phase of the project generally consisted of mobilization, air monitoring station installation, clearing of surficial trash and vegetation from the process and landfill areas, and debris removal.

Building and Structure Demolition

Building and structure demolition began on November 13, 2000. This phase included removal of highly-contaminated ash from the old incinerator, asbestos abatement, demolition of buildings and structures in the Process Area, underground storage tank removal, production well abandonment and placement of the demolition debris in the on-site landfill area.

Contractors removed a minimum of 2 feet of soil across the entire Process Area and perimeter of the landfill outside of the cover system to the limits of the property boundaries until remaining soil complied with maximum specified contaminant concentrations. The vertical extent of the excavation continued to a minimum of 24 inches or until remedial goals were achieved. Soil was transported to the on-site landfill area for disposal.

Landfill Closure

Landfill closure and site restoration work began in May 2001, including: site grading, stormwater system installation, landfill subgrade preparation, liner system installation, vegetative soil cover placement, topsoil placement, and seeding or sodding.

PRP contractors removed contaminated sediments from Lake Stupid, now the wet retention area, and placed sediments in the landfill. Water from the wet retention area was used for dust control during demolition and excavation activities. Wet retention area sediment was removed to a depth of 2 feet and disposed of in the landfill. The sediment was partially replaced with 2 feet of clean soil.

The cap is designed to minimize infiltration of water into the waste materials below the cap. To function properly, the cap must stay intact as a continuous barrier over the waste material and promote quick rainfall runoff. The PRP contractor also installed methane gas vents and drainage pipes and constructed stormwater retention basins and ditches as part of cap construction.

A barrier was installed to prevent materials from the landfill from coming in contact with receptors in Rock Pit Lake. The barrier consists of a heavy geotextile fabric covered with stone riprap installed along the existing lake bank.

Contractors installed seven clusters of groundwater monitoring wells around the Site.

4.3 Operation and Maintenance (O&M)

The EPA approved the Site's O&M plan in November 2002. The City is responsible for oversight and implementation of O&M activities. The City is responsible for procuring services required under the O&M plan and ensuring that the activities are performed in accordance with the O&M guidance. O&M activities are performed by a team of consultants, laboratories and contractors.

The City is responsible for routine inspections of the cap and fence. Routine monthly cap maintenance includes mowing, reseeding and mulching bare spots on the cap, trimming excessive vegetative growth in ditches, removing silt from pipes and ditches, stormwater management, fence maintenance, sign maintenance, and roadway maintenance. Other O&M contractor activities include groundwater, fish tissue, and sediment sampling and analysis. The City requested a reduction in monitoring activities in a 2016 letter to the EPA.

O&M costs established in the 1996 ROD were \$3,431,000 for 30 years of O&M activities (approximately \$114,400 per year in 1996). The City estimates O&M costs over the past five years to be approximately \$161,000. This figure includes monitoring, grass cutting and fence repairs.

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2011 FYR for the Site stated:

The remedy currently protects human health and the environment in the short term because the landfill cap construction is complete and the required institutional controls (ground water and land use restrictions) are in place. However, in order for the remedy to be protective in the long term, cleanup goals for ground water and fish tissue must still be met. The following actions need to be taken to ensure protectiveness while ground water and fish tissue continue to recover:

- *Use enforcement authority, if necessary, to gain access to Rock Pit Lake for sampling.*
- *Encourage the burrowing owls to leave the capped area of the Site by: (a) relocating their perches to an area away from the landfill cap; and/or (b) coordinating with the Florida Fish and Wildlife Conservation Commission to relocate them.*

The 2011 FYR included two issues and recommendations. This report summarizes each recommendation and its current status in Table 5.

Table 5: Progress on Recommendations from the 2011 FYR

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Request access six months before needed so that the EPA can get a warrant, if needed, to address access issues at Rock Pit Lake.	PRP	04/30/2012	Considered and not implemented. The City did not require the EPA to assist with obtaining access to Rock Pit Lake. They were able to obtain access to sample in 2013 and 2015.	11/1/2013
Encourage the burrowing owls to leave the capped area of the Site by: (a) relocating their perches to an area away from the landfill cap; and/or (b) coordinating with the Florida Fish and Wildlife Conservation Commission to relocate them.	PRP	12/31/2011	Complete. The perches have been relocated, resulting in the owls moving off site.	09/23/2015

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated the FYR in September 2015 and scheduled its completion for July 2016. EPA remedial project manager (RPM) Pam Scully led the EPA site review team, which also included EPA community involvement coordinator (CIC) L'Tonya Spencer and contractor support provided to the EPA by Skeo Solutions. In September 2015, the EPA held a kick off call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In September 2015, the EPA published a public notice in the *Sun Sentinel* newspaper announcing the commencement of the FYR process for the Site, providing contact information for Pam Scully and L'Tonya Spencer, and inviting community participation. The press notice is available in Appendix B. No one contacted the EPA as a result of the advertisement.

The EPA will make the final FYR Report available to the public. Upon completion of the FYR, the EPA will place copies of the document in the designated site repository: Broward County Library, located at 100 South Andrews Avenue in Fort Lauderdale.

6.3 Document Review

This FYR included a review of relevant, site-related documents, including the ROD and the 1997 and 2000 ESDs. A complete list of the documents reviewed can be found in Appendix A.

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain “a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment.” The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate.

- Applicable requirements are those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, remedial action, location or other circumstance found at a CERCLA site.
- Relevant and appropriate requirements are those standards that, while not “applicable,” address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards more stringent than federal requirements may be applicable or relevant and appropriate.
- To-Be-Considered (TBC) criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For example, TBC criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or be discharged to, the ambient environment. Examples of chemical-specific ARARs include maximum contaminant levels (MCLs) under the federal Safe Drinking Water Act and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated groundwater or in-situ remediation.

Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater

The Site's 1996 ROD established remedial goals for eight groundwater COCs: aluminum, antimony, benzene, bis(2-ethylhexyl) phthalate, cadmium, lead, manganese and mercury. The 2000 ESD deleted cleanup goals for aluminum and manganese from the remedy; cleanup goals for these two COCs are no longer applicable. In the 1996 ROD, groundwater remedial goals for groundwater COCs were based on federal and Florida primary drinking water standards. Standards for groundwater COCs have not changed (Table 6). In 2005, FDEP established promulgated health-based groundwater cleanup target levels (GCTLs) under FAC Chapter 62-777.

Table 6: ARAR Review for Groundwater COCs

COC	1996 ROD Groundwater Remedial Goals^a (µg/L)	Current ARARs (µg/L)	ARAR Change
Antimony	6	6 ^{c,d}	No change
Benzene	1	1 ^d	No change
Bis(2-ethylhexyl) phthalate ^b	6	6 ^{c,d}	No change
Cadmium	5	5 ^{c,d}	No change
Lead	15	15 ^{d,e}	No change
Mercury	2	2 ^{c,d}	No change

Notes:

a. Based on federal and/or Florida drinking water MCLs.

b. This COC is also called di(2-ethylhexyl)phthalate. It is referenced as such in the federal and state MCL listings.

c. Federal Safe Drinking Water Act MCLs are available at:

<http://www.epa.gov/safewater/contaminants/index.html> (accessed 9/3/2015).

d. Florida Safe Drinking Water Act MCLs are available at:

<http://www.dep.state.fl.us/legal/Rules/drinkingwater/62-550.pdf> (accessed 9/3/2015).

e. Under the federal Safe Drinking Water Act, lead is regulated by a treatment technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. The action level for lead is 15 µg/L, or 0.015 milligrams per liter (mg/L).

µg/L = micrograms per liter

Soil and Sediment ARARs

Federal ARARs have not been established for soil or sediment COCs. The evaluation of the soil remedial goals compared to the EPA health-based screening levels and state SCTLs is further reviewed in Section 7.2.

Surface Water

The 1996 ROD established federal acute and chronic ambient water quality criteria (AWQCs) for fresh water as the goals for surface water. The AWQCs will confirm the effectiveness of the landfill closure in mitigating the surface water migration pathway for the 10 COCs listed in Table 7. At the time of this FYR, current acute and chronic water quality criteria for aluminum and antimony both remain unchanged.¹ An acute criterion for beryllium was not provided in the 1996 ROD. The chronic criterion for beryllium remains unchanged.² The acute and chronic water quality criteria for cadmium are more stringent.³

National recommended acute and chronic water quality criteria for copper are not listed but can be determined using the Biotic Ligand Model (BLM). An acute criterion for iron was not provided in the 1996 ROD and a national recommended acute water quality criterion has not been issued; the chronic criterion for iron of 1,000 micrograms per liter (µg/L) has not changed. The acute and chronic water quality criteria are more stringent for lead. The acute criterion for mercury is more stringent; the chronic criterion for zinc is less stringent. The acute criterion for silver is more stringent but a national recommended chronic criterion has not been issued. The acute criterion for zinc is more stringent while the chronic value is less stringent.

Table 7: Surface Water Monitoring Criteria

COC	AWQC: Acute			AWQC: Chronic		
	1996 ROD Cleanup Goals (µg/L)	Current ARARs ^a (µg/L)	ARAR change	1996 ROD Cleanup Goal (µg/L)	Current ARARs ^a (µg/L)	ARAR change
Aluminum	750	750	no	87	87	no
Antimony	88	NA ^b	no	30	NA ^b	withdrawn
Beryllium	NA	NA ^b	NA	0.13	0.13 ^b	no
Cadmium ^c	3.9	2.0	more stringent	1.1	0.25	more stringent
Copper	19	NA	NA	13	NA	NA
Iron	NA	NA	NA	1000	1000	no
Lead ^c	96	65	more stringent	3.6	2.5	more stringent
Mercury	2.4	1.4	more stringent	0.012	0.77	less stringent

¹ National recommended acute and chronic criteria for antimony have not been issued.

² National recommended chronic criterion for beryllium has not been issued.

³ Dissolved metal criteria for cadmium, lead, silver and zinc are based on the calculations in Appendix B of the National Recommended Water Quality Criteria (<http://www.epa.gov/waterscience/criteria/wgctable/#appendxb>), which includes the water hardness. The values shown for the current cleanup goals are from the National Recommended Water Criteria, which use a default 100 mg/L calcium carbonate hardness value to illustrate the application of the calculation. No hardness value was defined in site decision documents, so the 100 mg/L hardness value is used as a proxy value.

COC	AWQC: Acute			AWQC: Chronic		
	1996 ROD Cleanup Goals (µg/L)	Current ARARs ^a (µg/L)	ARAR change	1996 ROD Cleanup Goal (µg/L)	Current ARARs ^a (µg/L)	ARAR change
Silver ^c	4.8	3.2	more stringent	0.12	NA	NA
Zinc ^c	127	120	more stringent	115	120	less stringent

Notes:

a. National Recommended Water Quality Criteria are available at <http://www.epa.gov/waterscience/criteria/wqctable> (accessed 9/3/2015).

b. No promulgated AWQC.

c. Dissolved metal criteria are based on the calculations in Appendix B of the National Recommended Water Quality Criteria (<http://www.epa.gov/waterscience/criteria/wqctable/#appendxb>, accessed 9/3/2015), which includes the water hardness. The values shown for the current cleanup goals are from the National Recommended Water Criteria, which uses a default 100 mg/L calcium carbonate hardness value to illustrate the application of the calculation. No hardness value was defined in site decision documents, so the 100 mg/L hardness value is used as a proxy value.

According to EPA's summary table containing national recommended water quality criteria for the protection of aquatic life and human health in surface water, freshwater criteria were calculated using the BLM. The table further notes that available toxicity data, when evaluated using the procedures described in the "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses," indicate that freshwater aquatic life should be protected if the 24-hour average and four-day average concentrations do not respectively exceed the acute and chronic criteria concentrations calculated by the BLM.

NA = not applicable
µg/L = micrograms per liter

Institutional Control Review

Two parcels of land – 494232000110 and 494232000120 – make up most of the Site's land area (Figure 3). Ten additional parcels were annexed to the Site during construction of the remedy. The City owns all property parcels at the Site. The 1996 ROD included institutional control restrictions for the two original parcels; it did not include institutional controls for the additional parcels. The Broward County Official Records website provided information for these 10 properties.⁴

Table 8 lists the institutional controls associated with areas of interest at the Site. The objectives of the institutional controls at the Site are to restrict the use of wells to extract groundwater for drinking, restrict the installation of new wells and restrict any use of the Site that could disturb the integrity of the landfill cap. These restrictions are included in a Declaration (Instrument Number 100452441, Book 30746, Page 1530). A Notice of Obligation to Provide Access in Accordance with Section IX of the Consent Decree for the Wingate Road Municipal Incinerator and Landfill Superfund Site is also logged (Instrument Number 100452440, Book 30746, Page 1524).

⁴ Broward County Official Records Search: <https://officialrecords.broward.org/oncoreV2/Search.aspx> (accessed 01/15/2016).

Table 8: Institutional Control (IC) Summary

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place
Groundwater	Yes	Yes	494232000110 and 494232000120	Restrict installation of groundwater wells and the use of existing ones for drinking purposes.	2000 Deed Restriction
Land	Yes	Yes	494232000110 and 494232000120	Prohibit the use of the Site in any manner that would affect the final cover or any component of the containment system.	2000 Deed Restriction
<i>Notes:</i> The Site also includes 10 parcels annexed to support construction of the remedy. These 10 parcels are 494232013151, 494232013150, 494232013152, 494232015740, 494232015750, 494232015751, 494232015760, 494232015770, 494232015780 and 494232015781.					

Figure 3: Institutional Control Base Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the site, and is not intended for any other purpose.

6.4 Data Review

During this five year review period, TASK Environmental (PRP contractor) conducted sampling that was modified in both scope and schedule. The modified sampling was proposed in a November 2010 letter to the EPA, was approved in March 2011 by the EPA. It required the following sampling of groundwater, Rock Pit Lake sediment and Rock Pit Lake fish tissue:

Media	Parameters	Frequency
Groundwater		
MW-1A	Arsenic	Annually
MW-1C, 7B, 7C	Ammonia	Annually
MW-1B, 2A, 4A, 4C, 5C, 6A, 7A	Antimony	Annually
MW-2B	Lead	Annually
Rock Pit Lake Sediment	Antimony, Arsenic, Cadmium	Once per 2 years
Rock Pit Lake Fish Tissue	Dioxins	Once per 2 years

TASK Environmental submitted a request to the EPA in January 2016 for approval to:

- discontinue groundwater sampling and analysis;
- plug and abandon all monitoring wells;
- discontinue sediment and fish tissue sampling and analysis; and
- abandon the methane monitor wells.

The City will continue to inspect and maintain the cap, fence and stormwater management system.

Groundwater

For this FYR, data from 2011 to 2014 were analyzed. Samples had detections of antimony, arsenic, lead and ammonia. As per FDEP's request during the 2005 FYR, samples were also analyzed for aluminum, manganese and ammonia, and compared to secondary drinking water standards. Of these metals, the only groundwater cleanup goals established by the EPA in the ROD were for antimony and lead. Detections of contaminants identified in the 11 wells sampled for this FYR are presented in Table 9.

- Antimony was detected in only two wells between 2011 and 2014 at concentrations of 1.1 µg/L in WN-GW-MW-4A and 2.3 µg/L in WN-GW-MW-6A; both concentrations were detected in 2014 and are below the MCL of 6 µg/L. All remaining data were below detection; the detection limits in October 2011 for antimony were 6.5 µg/L, which slightly exceeds the MCL. Since 2011, the detection limits have been below the MCL.
- Arsenic and lead were sampled for in only one well each, WN-GW-MW-1A and WN-GW-MW-1B, respectively; however, these metals were below detection and detection limits were below the ROD cleanup goal.
- Ammonia was detected above the FDEP GCTL of 2.8 mg/L in every sample collected from two wells – WN-GW-MW-1C and WN-GW-MW-7C – from 2011 to 2014. Ammonia is not a site COC.

Table 9: Summary of Groundwater Data Collected from 2011 to 2014

Parameter		Antimony (µg/L)	Arsenic (µg/L)	Lead (µg/L)	Ammonia (mg/L)
Cleanup Goal		6	10	15	FDEP GCTL - 2.8
Sample #	Date				
WN-GW-MW-1A	10/2011	NA	4.8 U	NA	NA
WN-GW-MW-1A	11/2012	NA	3.3 U	NA	NA
WN-GW-MW-1A	10/2013	NA	3.3 U	NA	NA
WN-GW-MW-1A	11/2014	NA	5.0 U	NA	NA
WN-GW-MW-1B	10/2011	6.5 U	NS	4.4 U	NA
WN-GW-MW-1B	11/2012	2.26 U	NS	2.9 U	NA
WN-GW-MW-1B	10/2013	2.3 U	NS	2.9 U	NA
WN-GW-MW-1B	11/2014	0.50 U	NS	5.0 U	NA
WN-GW-MW-1C	10/2011	NA	NA	NA	6.3 V
WN-GW-MW-1C	11/2012	NA	NA	NA	7.1
WN-GW-MW-1C	10/2013	NA	NA	NA	5.3
WN-GW-MW-1C	11/2014	NA	NA	NA	4.9
WN-GW-MW-2A	10/2011	6.5 U	NA	NA	NA
WN-GW-MW-2A	11/2012	2.26 U	NA	NA	NA
WN-GW-MW-2A	10/2013	2.3 U	NA	NA	NA
WN-GW-MW-2A	11/2014	0.50 U	NA	NA	NA
WN-GW-MW-4A	10/2011	6.5 U	NA	NA	NA
WN-GW-MW-4A	11/2012	2.26 U	NA	NA	NA
WN-GW-MW-4A	10/2013	2.3 U	NA	NA	NA
WN-GW-MW-4A	11/2014	1.1	NA	NA	NA
WN-GW-MW-4C	10/2011	6.5 U	NA	NA	NA
WN-GW-MW-4C	11/2012	2.26 U	NA	NA	NA
WN-GW-MW-4C	10/2013	2.3 U	NA	NA	NA
WN-GW-MW-4C	11/2014	0.50 U	NA	NA	NA
WN-GW-MW-5C	10/2011	6.5 U	NA	NA	NA
WN-GW-MW-5C	11/2012	2.26 U	NA	NA	NA
WN-GW-MW-5C	10/2013	2.3 U	NA	NA	NA
WN-GW-MW-5C	11/2014	0.50 U	NA	NA	NA
WN-GW-MW-6A	10/2011	6.5 U	NA	NA	NA
WN-GW-MW-6A	11/2012	2.26 U	NA	NA	NA
WN-GW-MW-6A	10/2013	2.3 U	NA	NA	NA
WN-GW-MW-6A	11/2014	2.3	NA	NA	NA
WN-GW-MW-7A	10/2011	6.5 U	NA	NA	NA
WN-GW-MW-7A	11/2012	2.26 U	NA	NA	NA
WN-GW-MW-7A	10/2013	2.3 U	NA	NA	NA
WN-GW-MW-7A	11/2014	0.50 U	NA	NA	NA
WN-GW-MW-7B	10/2011	NA	NA	NA	1.7 V
WN-GW-MW-7B	11/2012	NA	NA	NA	1.7
WN-GW-MW-7B	10/2013	NA	NA	NA	1.4
WN-GW-MW-7B	11/2014	NA	NA	NA	1.5
WN-GW-MW-7C	10/2011	NA	NA	NA	5.6 V
WN-GW-MW-7C	11/2012	NA	NA	NA	4.6
WN-GW-MW-7C	10/2013	NA	NA	NA	5.5
WN-GW-MW-7C	11/2014	NA	NA	NA	3.6

Notes:

NA = not analyzed

NS = not sampled

U = non-detect

Parameter		Antimony (µg/L)	Arsenic (µg/L)	Lead (µg/L)	Ammonia (mg/L)
Cleanup Goal		6	10	15	FDEP GCTL - 2.8
Sample #	Date				
V = analyte detected in the associated method blank. µg/L = micrograms per liter mg/L = milligrams per liter					

Rock Pit Lake Sediments

Sediment samples were taken in 2013 and 2015 at Rock Pit Lake. Antimony, arsenic and cadmium were detected in all samples in 2013 (Table 10). In 2015, cadmium was detected in all samples, antimony was detected in WN-RPL-SE-1 and WN-RPL-SE-2, and arsenic was detected in all samples except WN-RPL-SE-6. Samples were not analyzed for dioxin or toxaphene. In 2013, antimony and arsenic were detected above the cleanup goals of 67 milligrams per kilogram (mg/kg) and 46 mg/kg, respectively, in two sample locations – WN-RPL-SED-03 and WN-RPL-SED-04 (Table 10). Cadmium concentrations in 2013 exceeded the cleanup goal of 170 mg/kg in three sampling locations – WN-RPL-SED-06 as well as the same sample locations that exceeded cleanup goals for antimony and arsenic. The exceedances at these three locations were 1.5 to 2 times the cleanup goals. There were no concentrations above the cleanup goals in the 2015 samples.

Table 10: Concentration of Metals in Rock Pit Lake Sediments

Parameter		Antimony	Arsenic	Cadmium
Units		mg/kg	mg/kg	mg/kg
1996 ROD Cleanup Goal		67	46	170
Sample #	Date			
WN-RPL-SED-01	02/01/2013	26	18	74
WN-RPL-SED-01	09/01/2015	32	17.6	122
WN-RPL-SED-02	02/01/2013	10	8.7	1.6
WN-RPL-SED-02	09/01/2015	20.7	12.2	96.8
WN-RPL-SED-03	02/01/2013	140	59	260
WN-RPL-SED-03	09/01/2015	4.3 U	5.6 I	1.9
WN-RPL-SED-04	02/01/2013	130	56	230
WN-RPL-SED-04	09/01/2015	0.75 U	3.6	2
WN-RPL-SED-05	02/01/2013	21	14	39
WN-RPL-SED-05	09/01/2015	4.4 U	5.4 I	1.4
WN-RPL-SED-06	02/01/2013	87	37	190
WN-RPL-SED-06	09/01/2015	0.97 U	0.65	5.3
Notes: Bold = contaminant exceeds 1996 ROD cleanup goal. U = sample was analyzed for compound, but compound not detected. I = Reported value is between the laboratory method detection limit and the laboratory practical quantitation limit. mg/kg = milligrams per kilogram				

Rock Pit Lake Fish Tissue

The only fish fillet samples available since the last FYR from Rock Pit Lake were two samples collected in 2013 and 2015 that were sampled for dioxin compounds (Appendix F, Table F-1). The analytical

results for individual dioxin compounds were converted to total dioxin toxicity equivalence (TEQs) by multiplying each dioxin compound by a toxicity equivalency factor (TEF) established by the World Health Organization in 2005 (Appendix F, Table F-2). The total dioxin equivalent concentration for the 2013 and 2015 fish samples were 0.189 nanogram per kilogram (ng/kg) and 0.168 ng/kg, respectively. These values were similar to the concentrations that were observed in 2008 to 2010, which had dioxin TEQs ranging from 0.247 ng/kg in 2008 to 0.15 ng/kg in 2010. Dioxin TEQ concentrations at the site have not significantly changed historically, but the concentration in all samples remain above the cleanup goal of 0.02 ng/kg. See section 7.2 for a screening level risk-based evaluation.

6.5 Site Inspection

On September 24, 2015, Pam Scully of the EPA, Susan Tobin of TASK Environmental (PRP contractor), Todd Hiteshew and Mike Pafford of the City, Kelsey Helton of FDEP, and Treat Suomi and Brice Robertson of the EPA contractor Skeo Solutions, performed the site inspection. The overall purpose of the inspection was to assess the efficacy of the Site's remedy. The site inspection included the inspection of monitoring wells, drainage facilities, the landfill cap, perimeter fencing, gates and signs. The site inspection checklist and photographs are provided in Appendices D and E.

The fencing surrounding the Site was in good condition, except for a small portion along the northern boundary of Rock Pit Lake, which appeared to be cut. The capped area had well-established vegetative cover, maintained monthly by the City's O&M staff. All monitoring wells were locked, well marked and in good working condition. The drainage system appeared to be in good condition and no wet areas were present on the landfill surface. The wet retention area on the southeastern portion of the Site was also in good condition and contained water at the time of the inspection. Several specimens of burrowing owls (*Athene cunicularia*) were observed during the visit. However, all were observed to the south of the capped area and none were observed on the cap. It appears as if the perches placed along the access road have been working to relocate the burrowing owls off site. Each specimen was near these perches, with one owl resting atop one of the perches.

Skeo Solutions performed research at the site repository at Broward County Library at 100 South Andrews Avenue in Fort Lauderdale. The library has a complete copy of all early administrative records for the Site, including the 1996 ROD and the 1997 and 2000 ESDs. However, there were no copies of the 2005 and 2011 FYRs. O&M reports are all current up through 2015.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners and regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. All of the interviews took place via email. The interviews are summarized below. Appendix C provides the complete interviews.

Pam Scully: Ms. Scully is the EPA's RPM for the Site. Ms. Scully thinks the Site is well maintained and monitored. Since closure completion in 2003, there has been little effect on the surrounding community from the Site. Occasionally, there has been redevelopment interest in the Site, but to date, nothing has worked out. The Site is fenced and well maintained by the City's Public Works Department. Groundwater meets federal and state standards. The remedy provides protection intended by the ROD.

Ms. Scully is comfortable with the institutional controls and is not aware of any community concerns regarding the Site.

Susan Tobin: Ms. Tobin is from the site PRP's O&M contractor, TASK Environmental. Ms. Tobin believes the Site is well maintained and well managed and should be available for reuse. The remedy is protective of human health and the environment, COCs in the groundwater and surface water are below site cleanup goals, and sediment and fish tissue quality are stable. Burrowing owls had taken up residence on top of the landfill but were successfully relocated. Ms. Tobin believes that groundwater monitoring should cease and all wells should be plugged, with surface casings removed. She believes the fish tissue and sediment sampling should also cease.

Todd Hiteshew: Mr. Hiteshew is from the City of Fort Lauderdale, which is a PRP at the Site and is responsible for site O&M. Mr. Hiteshew feels the Site is effectively maintained and the remedy continues to be effective. He is not aware of any effects on the surrounding community. Groundwater contaminant levels have declined below cleanup goals and COCs in sediment and fish tissue are stable, with a decrease in sediment concentrations. Mr. Hiteshew recommends a reduction in monitoring.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

A review of the relevant site documents, ARARs and site inspection indicate that the remedy, as specified in the 1996 ROD and amended by the 1997 and 2000 ESDs, is functioning as intended. The remedy required closure of the Site's incinerators and landfill in accordance with state and federal requirements. This portion of the remedy has been satisfied via capping of the landfill using a geosynthetic membrane, implementation of stormwater management, drainage control and grading. Site access controls include locks on the security fencing. The PRP is currently monitoring the landfill in accordance with the Site's O&M plan.

Federal Clean Water Act water quality regulations regulate discharges (both point and non-point) to waters of the United States. As there are no point source discharges from the Site to waters of the United States, it is assumed that the water quality standards referenced in the 1996 ROD were intended for application to stormwater runoff from the landfill. Stormwater runoff from the landfill is directed into the on-site wet retention area, with a net zero discharge outside of the Site. Although analytical data have not been required to verify that the stormwater meets ambient water quality standards, this use of stormwater is in accordance with the approved landfill closure design with required runoff water management.

The PRP has filed deed restrictions with Broward County for the two original site parcels described in the 1996 ROD. The deed restrictions restrict the use of groundwater in any way, as well as installation of groundwater wells. The same instrument also restricts use of the land in any way that would harm the remedy. Site O&M activities include grass cutting and fence maintenance. Current O&M procedures should maintain the effectiveness of the remedy at the Site. The perimeter fence surrounding the Site was cut at the time of the site inspection. It was repaired in October 2015.

Groundwater monitoring data indicate that cleanup levels are being achieved for the remaining COCs that historically had exceeded the ROD cleanup goals to include antimony, arsenic and lead.

Sediment was sampled in 2013 and 2015 from Rock Pit Lake. Antimony, arsenic and cadmium were detected at concentrations above the cleanup goals in two sample locations (WN-RPL-SED-03 and WN-RPL-SED-04) and cadmium in a third location (WN-RPL-SED-06) in 2013. The exceedances at these three locations were 1.5 to 2 times the cleanup goals. There were no exceedances in 2015.

Dioxin concentrations in fish fillet samples from the lake remain above the cleanup goal of 0.02 ng/kg, but concentrations appear to be consistent with concentrations detected during the 2010 FYR. The relative significance of the concentrations detected in the fish fillet are evaluated in Section 7.2 due to the changes in toxicity values that have occurred since the 1996 ROD.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Exposure assumptions and RAOs have not changed since the 1996 ROD and 1997 and 2000 ESDs. Toxicity values have changed for dioxin as a result of the EPA's reassessment in 2012.⁵ The remedial goals for dioxin in soil, sediment and fish were reviewed through a screening-level residential risk evaluation comparing ROD cleanup goals to the EPA's residential regional screening level (RSL). As shown in Table 11, the remedial goal for dioxin in soil exceeds the noncancer hazard quotient (HQ) of 1.0 based on the new noncancer toxicity value for this compound. The less stringent remedial goal does not call into question the protectiveness of the Site's remedy. Dioxin-contaminated soils were excavated, placed into the onsite landfill and the landfill was capped. Deed restrictions are in place to ensure the final cover is not disturbed so there are no completed exposure pathways to the contaminated soil. Soil excavation performance standards were met. Confirmation sampling is shown in Appendix F, Figure F-1.

The 1996 ROD soil dioxin remedial goal of 0.0006 mg/kg TEQs remains protective for commercial and industrial exposure. The 2016 dioxin worker cancer RSL is 0.000022 mg/kg TEQ and non-cancer RSL for soil dioxin is 0.00072 mg/kg TEQ which is equivalent to a cancer risk of 2.7×10^{-5} and the non-cancer HQ of 0.8. These results are within EPA's acceptable cancer risk range and below EPA's non-cancer HQ of 1.

Rock Pit Lake sediment samples met the dioxin TEQ sediment remedial goal of 0.0013 mg/kg in 2004, shown in the Quarterly Monitoring Data Review, August 2002 through August 2004. In a letter dated February 10, 2005, FDEP agreed to a reduced sediment monitoring schedule, excluding dioxin sampling.

⁵ The EPA's dioxin reassessment has been developed and undergone review for many years, with the participation of scientific experts in EPA and other federal agencies, as well as scientific experts in the private sector and academia. The Agency followed current guidelines and incorporated the latest data and physiological/biochemical research into the reassessment. On February 17, 2012, EPA released the final human health non-cancer dioxin reassessment, publishing an oral non-cancer toxicity value, or reference dose, of 7×10^{-10} mg/kg-day for 2,3,7,8-tetrachlorodibenzo-p-dioxin in EPA's Integrated Risk Information System. The dioxin cancer reassessment will follow thereafter. The dioxin reference dose was approved for immediate use at Superfund sites to ensure protection of human health.

Table 11: Risk Evaluation of Human Health-Based Remedial Goals for Dioxin

COC	1996 ROD Remedial Goal (mg/kg)	EPA Residential RSL ^a		Residential	
		1 x 10 ⁻⁶ Risk	HQ = 1.0	Risk ^b	Noncancer HQ ^c
Soil					
Dioxin TEQ	0.0006	0.0000048	0.000051	1 x 10 ⁻⁴	12
Sediment					
Dioxin TEQ	0.0013	NA	NA	NA	NA
Fish Tissue					
Dioxin TEQ	0.00000002	0.000000032 ^d	0.0000011 ^d	6 x 10 ⁻⁷	0.02
Notes:					
a. Current RSLs, dated May 2016, are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016 (accessed 7/15/2016).					
b. Cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10 ⁻⁶ risk: Cancer risk = (1996 ROD remedial goal ÷ soil cancer RSL) × 10 ⁻⁶					
c. The noncancer HI was calculated using the following equation: HI = (1996 ROD remedial goal ÷ soil noncancer RSL)					
d. Fish RSL values were calculated using EPA's calculator based on a default daily fish consumption of 54 grams per day.					
NA = not applicable; sediments are covered by water. Therefore, EPA Region 4 does not consider exposure to sediment as a completed exposure pathway.					
Bold = cancer risk exceeds 1 x 10 ⁻⁴ or a noncancer HQ exceeds 1.0.					
TEQ = Toxicity Equivalence					
mg/kg = milligrams per kilogram					

The Site's 1996 ROD established a cleanup goal of 0.02 ng/kg of dioxin TEQs in fish fillet tissue to confirm the effectiveness of the landfill closure in mitigating this contaminant migration pathway. As shown in Table 11 the remedial goal remains valid as the cleanup goal is within the EPA's risk management range of 1 x 10⁻⁴ and 1 x 10⁻⁶ and below a noncancer hazard quotient (HQ) of 1.0 for nearby residents. In 2013, the dioxin TEQs for the fish sample was 0.189 ng/kg, which exceeds the ROD cleanup goal; however, based on a screening-level risk evaluation shown in Table 12, this concentration falls within EPA's risk management range and below the noncancer HQ of 1.0.

Table 12: Screening-level Risk Evaluation of Dioxin TEQs Detected in Fish

COC	2013 Fish Concentration (ng/kg)	EPA Residential RSL ^a		Residential	
		1 x 10 ⁻⁶ Risk	HQ=1	Risk ^b	Noncancer HQ ^c
Dioxin TEQ	0.189	0.032 ^d	1.1 ^d	6 x 10 ⁻⁶	0.2
<p>a. Current RSLs, dated May 2016, are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016 (accessed 7/15/2016).</p> <p>b. Cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10⁻⁶ risk: Cancer risk = (2013 site concentration ÷ fish cancer RSL) × 10⁻⁶</p> <p>c. The noncancer HI was calculated using the following equation: HI = (2013 site concentration ÷ fish noncancer RSL)</p> <p>d. Fish RSL value was calculated using EPA's calculator based on a default daily fish consumption of 54 grams per day. ng/kg = nanograms per kilogram</p>					

The MCL for arsenic has become more stringent since the 1996 ROD. However, long-term groundwater monitoring uses the most current MCL and data from this FYR period demonstrate that arsenic is below the current MCL. ARARs for surface water at the Site and at Rock Pit Lake have changed since the signing of the 1996 ROD. For cadmium, lead, mercury, zinc and silver, current ARARs are more stringent than AWQC acute cleanup goals. For cadmium and lead, current ARARs are more stringent for AWQC chronic cleanup goals. However, for mercury and zinc, ARARs are less stringent for AWQC chronic cleanup goals. In the case of the wet retention area at the Site, lead was not detected above the method detection limit from August 2002 through November 2009, and therefore, monitoring for lead ceased with EPA's concurrence. Cadmium was not considered a contaminant of concern because it was not detected in surface water samples collected following completion of the wet retention area construction. For Rock Pit Lake, lead and cadmium were not detected above the method detection limit from August 2002 through November of 2009, and therefore, monitoring for lead and cadmium ceased with EPA's concurrence.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The PRP consolidated wastes in the landfill and capped it using a geosynthetic membrane. Stormwater management, drainage control and grading has been implemented. The PRP is currently monitoring the landfill in accordance with the Site's O&M plan. Deed restrictions restrict the use of groundwater and restrict the installation of groundwater wells. The same instrument also restricts use of the land in any way that would harm the remedy. Groundwater monitoring data indicate that cleanup goals are being achieved for the remaining COCs that historically had exceeded ROD cleanup goals. Sediment in Rock Pit Lake exceeds cleanup goals. Exposure assumptions and RAOs have not changed since the 1996 ROD and 1997 and 2000 ESDs. Toxicity values have changed for dioxin as a result of the EPA's reassessment in 2012. However, this does not affect the protectiveness of the remedy, as shown in Section 7.2.

8.0 Issues, Recommendations and Follow-up Actions

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1

9.0 Protectiveness Statement

Table 13: Protectiveness Statement

Sitewide Protectiveness Statement
<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The Site's remedy is protective of human health and the environment. Landfill cap construction is complete and required institutional controls are in place to restrict land use and groundwater use. The RAO of reducing Site risks to health-based levels and protecting the surficial aquifer system beyond the current site boundary have been met.

10.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

Explanation of Significant Differences Wingate Road Municipal Incinerator and Landfill Site, Ft. Lauderdale, Broward County, Florida. United States Environmental Protection Agency Region 4. November 1997.

Explanation of Significant Differences Wingate Road Municipal Incinerator and Landfill Site, Ft. Lauderdale, Broward County, Florida. United States Environmental Protection Agency Region 4. May 2000.

Feasibility Study Wingate Road Municipal Incinerator and Landfill Site. Prepared by TASK Environmental for City of Fort Lauderdale, Florida and the Port Everglades Authority. November 1994.

First Five-Year Review Report for Wingate Road Incinerator Landfill Site, Fort Lauderdale, Florida. Prepared by United States Environmental Protection Agency Region 4. December 21, 2005.

Monitoring Results and Monitoring Modification Request. Wingate Road Municipal Incinerator and Landfill Site. Fort Lauderdale, Florida. Prepared by TASK Environmental. January 15, 2016.

Operations and Maintenance Plan for Wingate Road Municipal Incinerator and Landfill Site, Fort Lauderdale, Florida. Prepared by GeoSyntec Consultants. November 2002.

Record of Decision for the Wingate Road Municipal Incinerator and Landfill Site. U.S. Environmental Protection Agency Region 4. May 14, 1996.

Remedial Action Report for Wingate Road Municipal Incinerator and Landfill Site, Fort Lauderdale, Florida. Prepared by IT Corporation and Geosyntec Consultants for Wingate Cooperating Parties Group June 2003.

Second Five-Year Review Report for Wingate Road Municipal Incinerator Dump Superfund Site. Prepared by E2 Inc. for United States Environmental Protection Agency. June 21, 2011.

Appendix B: Press Notice

THE U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 4 ANNOUNCES THE COMPLETION OF THE FOURTH FIVE-YEAR REVIEW FOR THE STANDARD AUTO BUMPER CORP. SUPERFUND SITE.

HIALEAH, DADE COUNTY, FLORIDA
Purpose/Objective: The Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986, requires review of remedial actions addressing hazardous substances every five years to make sure the selected remedies remain protective of human health and the environment. In 2015, EPA conducted the fourth five-year review of the remedies for contaminated ground water and soils associated with the Standard Auto Bumper Corporation Superfund site (the Site) in Hialeah, Florida.

Site Background: A small electroplating facility operated at the Site, located at 2500 West 3rd Court, from 1959 to 1993. Until 1972, Standard Auto Bumper discharged wastewater from the electroplating and stripping process into a ditch at the back of the property. From 1972 until 1979, plating waste was treated and discharged into a percolation pit. The Dade County Department of Environmental Resources Management became aware of site contamination in 1977 and issued several violation notices to the property owners. In 1987, EPA confirmed heavy metal contamination of site soils and ground water resulting from wastewater disposal practices. EPA proposed the Site for listing on the Superfund program's National Priorities List (NPL) in June 1988. EPA finalized the Site on the NPL in October 1989.

Cleanup Actions: The cleanup plan focused on two areas: organic units (OU1) and groundwater unit (OU2). EPA selected the OU1 remedy in the Site's 1992 Record of Decision (ROD). It included excavation and off-site disposal of contaminated soils, backfilling of excavated areas with clean soil, and groundwater monitoring for up to five years. EPA selected the OU2 remedy in the Site's 1993 ROD. It included monitored natural attenuation of groundwater contaminants, groundwater use controls, and monitoring.

Five-Year Review Protectiveness: Standards: The remedy at OU1 currently protects human health and the environment because site soils were remediated to levels that support industrial use and institutional controls are in place, via a restrictive covenant and permit notification system, to ensure appropriate use of the Site. In order for the remedy to be protective at the long term, steps should be taken to make sure all affected parties are fully aware of remaining site contamination and understand the associated controls. The remedy at OU2 is protective of human health and the environment. Groundwater monitoring indicates the cleanup goals have been met.

Five-Year Review Schedule: EPA completed the fourth five-year review process for the Site in July 2015. The next five-year review for the Site is required within five years of the signature of this Five-Year Review, by July 2020.

Contact Information: Community members who have questions about the Site or the Five-Year Review process are asked to contact:

Michael Taylor, EPA Remedial Project Manager
 Phone: (404) 562-8752
 Email: taylor.michael@epa.gov

L'Tonya Spencer, EPA Community Involvement Coordinator
 Phone: (404) 562-8463 | 1-877-718-3752 (toll-free)
 Email: spencer.latorya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional information is available at the Site's local document repository, located at John F. Kennedy Memorial Library, 190 West 49th Street, Hialeah, Florida 33012, and online at: <http://www.epa.gov/region4/superfund/sites/npl/florida/sthauto04.html>
 09/27/2015

THE U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 4 ANNOUNCES THE FIRST FIVE-YEAR REVIEW FOR THE FLASH CLEANERS SUPERFUND SITE.

POMPANO BEACH, BROWARD COUNTY, FLORIDA

Purpose/Objective: EPA is conducting a five-year review of the remedy for Flash Cleaners Superfund Site (the Site) in Pompano Beach, Florida. The purpose of the Five-Year Review is to make sure the selected cleanup actions effectively protect human health and the environment.

Site Background: The half-acre Site is located in a commercial and residential area. From 1977 to about 2004, Flash Cleaners operated a dry cleaning facility at the Site. Workers reportedly placed used wastewater to an on-site septic tank, which resulted in soil and groundwater contamination. In 2005, EPA listed the Site on the Superfund program's National Priorities List. Contaminants of concern in the soil included trichloroethylene (TCE), 1,1,2-trichloroethane (DCE) and vinyl chloride. Groundwater contaminants of concern included PCE, TCE, 1,1,2-DCE, trans-1,2-DCE and vinyl chloride.

Cleanup Actions: EPA selected the Site's long-term remedy in the Site's 2010 Record of Decision. It included excavation and disposal of contaminated soils, soil vapor extraction to remove soil contamination beneath the Flash Cleaners building, and injections of organic material into groundwater to speed up the natural breakdown of contaminants. The cleanup also required temporary institutional controls to prevent people from coming in contact with the groundwater during cleanup. EPA also periodically checks groundwater, surface water and water located in sediment.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions resulting in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The first of the Five-Year Reviews for the Site will be completed by September 2016.

EPA invites community participation in the Five-Year Review process. EPA is conducting this Five-Year Review to evaluate the effectiveness of the Site's remedy and to ensure that the remedy remains protective of human health and the environment. As part of the process, EPA staff members are available to answer any questions about the Site. Community members who have questions about the Site or the Five-Year Review process, or who would like to participate in a community interview, are asked to contact:

Ralph Howard, Jr., EPA Remedial Project Manager
 Phone: 404-562-8829
 Email: howard.ralph@epa.gov

L'Tonya Spencer, EPA Community Involvement Coordinator
 Phone: (404) 562-8463 | (800) 564-2577 (toll-free)
 Email: spencer.latorya@epa.gov

Mailing Address: EPA Region 4, 61 Forsyth St. S.W., Atlanta, GA 30303-8960

Additional site information is also available at the Site's document repository, Lighthouse Point Library, located at 2200 Northwest 38th Street in Lighthouse Point, Florida, and online at: <http://www.epa.gov/region4/superfund/sites/npl/florida/flash01.html>
 9/27/2015

THE U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 4 ANNOUNCES THE THIRD FIVE-YEAR REVIEW FOR THE WINGATE ROAD MUNICIPAL INCINERATOR DUMP SUPERFUND SITE.

FORT LAUDERDALE, BROWARD COUNTY, FLORIDA

Purpose/Objective: EPA is conducting the third five-year review of the remedy for the Wingate Road Municipal Incinerator Dump Superfund site (the Site) in Fort Lauderdale, Florida. The purpose of the Five-Year Review is to make sure the selected cleanup actions effectively protect human health and the environment.

Site Background: The 61-acre area is located at the intersection of NW 31st Avenue and NW 13th Street in northwestern Fort Lauderdale. From 1954 to 1978, the City of Fort Lauderdale operated waste incinerators, offices and a 40-acre disposal area on site. During operations, the facility received 480 tons of residential wastes, commercial wastes and incinerator residues each day. The City discharged cooling water from the incinerator into an unlined pond in the southeastern corner of the Site. The City also spread ash and water material on the ground in the disposal area. These practices resulted in the contamination of soil, sediment and surface water. EPA listed the Site on the Superfund program's National Priorities List (NPL) in 1989. Site contaminants include heavy metals and dioxin. In addition, EPA identified contaminants in Rock Pit Lake sediments. The lake borders the northeastern area of the Site.

Cleanup Actions: EPA selected a cleanup approach in the Site's 1996 Record of Decision (ROD). It included digging up contaminated soil and sediment and placing the material in the landfill, covering the landfill, and monitoring groundwater, surface water and fish tissue. EPA updated the remedy in 1997, modifying the cap construction material and requiring on-site treatment of off-site disposal of down soils from the old incinerator building. A second remedy update in 2000 modified soil and groundwater cleanup goals and added monitoring goals for surface water and fish tissue. The Site's potentially responsible party completed the cleanup in 2002. Operation and maintenance activities are ongoing.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The third of the Five-Year Reviews for the Site will be completed by February 2016.

EPA invites Community Participation in the Five-Year Review process. EPA is conducting this Five-Year Review to evaluate the effectiveness of the Site's remedy and to ensure that the remedy remains protective of human health and the environment. As part of the Five-Year Review process, EPA staff is available to answer any questions about the Site. Community members who have questions about the Site or the Five-Year Review process, or who would like to participate in a community interview, are asked to contact:

Pam Scully, EPA Remedial Project Manager
 Phone: (407) 562-8935
 Email: scully.pam@epa.gov

L'Tonya Spencer, EPA Community Involvement Coordinator
 Phone: (404) 562-8463 | (877) 718-3752 (toll-free)
 Email: spencer.latorya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional information is available at the Site's local document repository, located at Broward County Main Library, 100 South Andrews Avenue, Level 5, Fort Lauderdale, Florida 33301, and online at: <http://www.epa.gov/region4/superfund/sites/npl/florida/wingate.html>
 09/27/2015

Sun-Sentinel
 Sunday
 Sept. 27, 2015

Appendix C: Interview Forms

Wingate Road Municipal Incinerator Dump

Five-Year Review Interview Form

Site Name: Wingate Road Municipal
Incinerator Dump

EPA ID No.: FLD981021470

Subject Name: Pam Scully

Affiliation: U.S. EPA

Subject Contact Information: scully.pam@epa.gov, 404-562-8935

Time: 2:15 p.m.

Date: 11/02/2015

Interview Format (circle one): In Person Phone Mail Other: email

Interview Category: EPA Remedial Project Manager

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

I think the site is well maintained and monitored.

2. What have been the effects of the Site on the surrounding community, if any?

Since closure was completed in 2003, there has been little effect on the surrounding community from the Site.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?

Occasionally, there is a redevelopment interest, but nothing has worked out to date.

4. What is your assessment of the current performance of the remedy in place at the Site?

The Site is fenced and well maintained by the City of Fort Lauderdale's Public Works Department. The groundwater meets federal and state standards. The remedy provides the protection intended by the ROD.

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

I am comfortable with the institutional controls.

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.

No.

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

Site Name: Wingate Road Municipal Incinerator Dump **EPA ID No.:** FLD981021470

Subject Name: Susan Tobin **Affiliation:** TASK Environmental, Inc.

Date: 01/04/16

Interview Format (circle one): In Person Phone Mail Other: email

Interview Category: O&M Contractor

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

The project has been well managed and successfully cleaned up. The site is well maintained and available for reuse.

2. What is your assessment of the current performance of the remedy in place at the Site?

The current remedy is performing as designed and is protective of human health and the environment. Concentrations of COCs in the groundwater and surface water have diminished and are below site cleanup goals. The landfill cap provides an effective barrier to eliminate human contact with incinerator ash and minimizes infiltration of stormwater.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?

COCs in the groundwater and surface water are below site cleanup goals and have remained below goals for two years. Sediment and fish tissue quality are stable, as anticipated with the selected remedy for Rock Pit Lake.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.

O&M activities include mowing, maintenance of the fence, inspection of the cap and stormwater management system, and management of burrowing owls. City staff conduct O&M activities on a monthly basis and prepare monthly inspection reports. Groundwater is sampled annually. Fish tissue and sediment samples are collected every two years by TASK Environmental, Inc.

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

Since startup, surface water quality goals for the stormwater pond and Rock Pit Lake were achieved and we are no longer sampling surface water. Groundwater quality has improved and the frequency of monitoring and constituent list has declined in response to quality improvements. The frequency of fish tissue and Rock Pit Lake sediment sampling has declined in response to demonstrated stability of monitoring data. Landfill gas monitoring was discontinued because landfill gas was not detected in any of the gas monitoring wells. These changes do not affect the effectiveness of the remedy.

6. Have there been unexpected O&M difficulties or costs at the Site since startup or in the last five years? If so, please provide details.

Burrowing owls have taken up residence on the property, and had moved onto the top of the landfill during the previous FYR. However, city staff have successfully managed to maintain the owl population in an area that is not on the landfill cap.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.

The reduction in sample frequency and analytical parameters has represented a significant savings for the City.

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?

The COCs in the groundwater have diminished significantly in concentration and there have not been any exceedances in the cleanup goals in several years. The groundwater monitoring should cease, and all groundwater monitoring wells and gas monitoring wells should be plugged and surface casings removed. Since the fish tissue and sediment samples from Rock Pit Lake demonstrate no increases in COC concentrations, further sampling and analysis of these media should also cease. The City should continue to inspect the Site and fence on a monthly basis, and prepare inspection reports through the next FYR.

Site Name: Wingate Road Municipal
Incinerator Dump

EPA ID No.: FLD981021470

Subject Name: Todd Hiteshew

Affiliation: City of Fort Lauderdale

Subject Contact Information:

Date: 12/03/15

Interview Format (circle one): In Person Phone Mail Other: email

Interview Category: O&M Contractor

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

My overall impression of the project is the remedy continues to be effective; any O&M issues are quickly identified and resolved. The Site continues to be maintained effectively to ensure the remedy is still performing.

2. What is your assessment of the current performance of the remedy in place at the Site?

My assessment is the remedy is still currently performing as needed.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?

Groundwater data demonstrate that all groundwater contaminant levels have declined to levels below ROD cleanup goals. Contaminant concentrations in sediment and fish tissue from Rock Pit Lake are stable, with a decrease in concentrations in sediment samples.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.

Yes, the Site is inspected monthly with an inspection report completed by an environmental inspector. Any issues identified at time of inspection or on an as-needed basis are handled by the environmental inspector. The grounds as well as any fence repairs are managed by a contract with our Parks and Recreation Department.

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since startup or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

No changes.

6. Have there been unexpected O&M difficulties or costs at the Site since startup or in the last five years? If so, please provide details.

No unexpected difficulties related to O&M at the Site. Typically, O&M is just grounds maintenance and fence repairs.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.

No opportunities to optimize O&M activities or sampling effort. I feel current O&M activities are currently optimal for current site conditions.

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?

None at this time. We will request to reduce the monitoring even further as was requested and granted from the last FYR.

Site Name: Wingate Road Municipal
Incinerator Dump

EPA ID No.: FLD981021470

Subject Name: Todd Hiteshew

Affiliation: City of Fort Lauderdale

Date: 12/03/15

Interview Format (circle one): In Person Phone Mail Other: email

Interview Category: Potentially Responsible Parties (PRPs)

1. What is your overall impression of the remedial activities at the Site?

My overall impression is positive as the remedy is currently working as designed.

2. What have been the effects of the Site on the surrounding community, if any?

I have not been made aware of any positive or negative effects from the surrounding community about the Site from the time of the last FYR.

3. What is your assessment of the current performance of the remedy in place at the Site?

Positive assessment as the remedy is working as designed.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

I am not aware of any complaints.

5. Do you feel well informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

I feel well informed.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

None at this time.

Site Name: Wingate Road Municipal **EPA ID No.:** FLD981021470
Incinerator Dump
Subject Name: Susan Tobin **Affiliation:** TASK Environmental, Inc.
Date: 01/04/16
Interview Format (circle one): In Person Phone Mail Other: email

Interview Category: Potentially Responsible Parties (PRPs)

1. What is your overall impression of the remedial activities at the Site?

The remedial activities have been effective in reducing any risk to human health or the environment previously associated with the Site.

2. What have been the effects of the Site on the surrounding community, if any?

Unknown.

3. What is your assessment of the current performance of the remedy in place at the Site?

The remedy has performed as designed, eliminating the migration of contaminants to groundwater and eliminating the exposure pathway for humans and wildlife to landfilled material.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

No.

5. Do you feel well informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

Yes.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST	
I. SITE INFORMATION	
Site name: Wingate Road Municipal Incinerator Dump	Date of inspection: 09/23/2015
Location and Region: Fort Lauderdale, FL; Region 4	EPA ID: FLD981021470
Agency, office, or company leading the five-year review: EPA Region 4	Weather/temperature: Upper 80's, Mostly Cloudy then rain and thunderstorms
Remedy Includes: (Check all that apply) <div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____ </div> <div> <input checked="" type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls </div> </div>	
Attachments: <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached	
II. INTERVIEWS (Check all that apply)	
1. O&M site manager <u>Todd Hiteshaw</u> <u>Environmental Services Manager</u> Name Title Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by email email: <u>thiteshaw@fortlauderdale.gov</u> Problems, suggestions; <input type="checkbox"/> Report attached _____	
2. O&M staff Name Title Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by email email: Problems, suggestions; <input type="checkbox"/> Report attached _____	

3.	Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.			
	Agency _____ Contact _____	Name _____ _____	<u>Employee</u> Title _____	Date _____ _____
	Phone No. _____ Problems; suggestions; <input type="checkbox"/> Report attached _____			
	Agency _____ Contact _____			
	Name _____ _____			
	Title _____ _____			
	Date _____ _____			
	Phone No. _____ Problems; suggestions; <input type="checkbox"/> Report attached _____			
	Agency _____ Contact _____			
	Name _____ _____			
	Title _____ _____			
	Date _____ _____			
	Phone No. _____ Problems; suggestions; <input type="checkbox"/> Report attached _____			
	Agency _____ Contact _____			
	Name _____ _____			
	Title _____ _____			
	Date _____ _____			
	Phone No. _____ Problems; suggestions; <input type="checkbox"/> Report attached _____			
	Agency _____ Contact _____			
	Name _____ _____			
	Title _____ _____			
	Date _____ _____			
	Phone No. _____ Problems; suggestions; <input type="checkbox"/> Report attached _____			
4.	Other interviews (optional) <input type="checkbox"/> Report attached			
EPA Region 4: RPM Pam Scully, 404-562-8935				
O&M Contractor: Susan Tobin, 352-383-0717, susant@taskenvironmental.com				
III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	O&M Documents			
	<input checked="" type="checkbox"/> O&M manual	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
	<input type="checkbox"/> As-built drawings	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Maintenance logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: _____			
2.	Site-Specific Health and Safety Plan		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date
	<input type="checkbox"/> Contingency plan/emergency response plan		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date
	Remarks: _____		<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> N/A
3.	O&M and OSHA Training Records		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date
	Remarks: _____		<input type="checkbox"/> N/A	<input type="checkbox"/> N/A

4.	Permits and Service Agreements	<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Other permits _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
5.	Gas Generation Records		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
6.	Settlement Monument Records		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
7.	Groundwater Monitoring Records		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____					
8.	Leachate Extraction Records		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
9.	Discharge Compliance Records				
		<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Water (effluent)	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
10.	Daily Access/Security Logs		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
IV. O&M COSTS					
1.	O&M Organization				
		<input type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for State		
		<input type="checkbox"/> PRP in-house	<input type="checkbox"/> Contractor for PRP		
		<input type="checkbox"/> Federal Facility in-house	<input type="checkbox"/> Contractor for Federal Facility		
		<input checked="" type="checkbox"/> City of Fort Lauderdale			

2.	O&M Cost Records-	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Funding mechanism/agreement in place <input type="checkbox"/> Unavailable Original O&M cost estimate \$/year <input type="checkbox"/> Breakdown attached		
		Total annual cost by year for review period if available		
	From	To	\$	<input type="checkbox"/> Breakdown attached
	Date	Date	Total cost	
	From	To	\$	<input type="checkbox"/> Breakdown attached
	Date	Date	Total cost	
	From	To	\$	<input type="checkbox"/> Breakdown attached
	Date	Date	Total cost	
	From	To	\$	<input type="checkbox"/> Breakdown attached
	Date	Date	Total cost	
	From	To	\$	<input type="checkbox"/> Breakdown attached
	Date	Date	Total cost	

3.	Unanticipated or Unusually High O&M Costs During Review Period Describe costs and reasons: <u>None</u>
----	--

V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A

A. Fencing
1. Fencing damaged <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A Remarks: <u>One area of cut fencing along northern boundary of Rock Pit Lake.</u>

B. Other Access Restrictions
1. Signs and other security measures <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A Remarks: <u>Signage all along fence line on all sides.</u>

C. Institutional Controls (ICs)
--

1. Implementation and enforcement				
Site conditions imply ICs not properly implemented		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Site conditions imply ICs not being fully enforced		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Type of monitoring (e.g., self-reporting, drive by) <u>Self-reporting</u>				
Frequency <u>Monthly</u>				
Responsible party/agency <u>Broward County</u>				
Contact	<u>Todd Hiteshe</u>	Environmental Services Manager	<u>09/23/2015</u>	<u>954-828-7807</u>
Name		Title	Date	Phone no.
Reporting is up-to-date		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Reports are verified by the lead agency		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Violations have been reported		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Other problems or suggestions: <input type="checkbox"/> Report attached				
2. Adequacy <input checked="" type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A				
Remarks:				
D. General				
1. Vandalism/trespassing <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident				
Remarks: <u>Very little damage to one area of fence, which was cut.</u>				
2. Land use changes on site <input checked="" type="checkbox"/> N/A				
Remarks:				
3. Land use changes off site <input checked="" type="checkbox"/> N/A				
Remarks: _____				
VI. GENERAL SITE CONDITIONS				
A. Roads <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A				
1. Roads damaged <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A				
Remarks:				
B. Other Site Conditions				
Remarks:				
VII. LANDFILL COVERS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A				
A. Landfill Surface				
1. Settlement (Low spots) <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Settlement not evident				
Aerial extent _____			Depth _____	
Remarks: _____				

2.	Cracks Lengths _____ Widths _____ Depths _____ Remarks: _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident	<input checked="" type="checkbox"/> Cracking not evident Depths _____
3.	Erosion Arial extent _____ Remarks: _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident Depth _____
4.	Holes Arial extent _____ Remarks: <u>Burrowing owls present in area off to the south of the landfill cap. No owls observed on the cap.</u>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Holes not evident Depth _____
5.	Vegetative Cover <input checked="" type="checkbox"/> No signs of stress Remarks: _____	<input checked="" type="checkbox"/> Grass <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)	<input checked="" type="checkbox"/> Cover properly established
6.	Alternative Cover (armored rock, concrete, etc.) Remarks: _____	<input checked="" type="checkbox"/> N/A	
7.	Bulges Arial extent _____ Remarks: _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Bulges not evident Height _____
8.	Wet Areas/Water Damage <input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Wet areas <input type="checkbox"/> Location shown on site map Arial extent _____ <input type="checkbox"/> Ponding <input type="checkbox"/> Location shown on site map Arial extent _____ <input type="checkbox"/> Seeps <input type="checkbox"/> Location shown on site map Arial extent _____ <input type="checkbox"/> Soft subgrade <input type="checkbox"/> Location shown on site map Arial extent _____ Remarks: <u>No wet areas on landfill surface. Drainage system working properly.</u>		
9.	Slope Instability <input checked="" type="checkbox"/> No evidence of slope instability Arial extent _____ Remarks: _____	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map
B. Benches <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	Flows Bypass Bench Remarks: _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
2.	Bench Breached Remarks: _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay

3.	Bench Overtopped	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
Remarks: _____			
C. Letdown Channels <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement (Low spots)	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of settlement
Aerial extent _____		Depth _____	
Remarks: _____			
2.	Material Degradation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation
Material type _____		Aerial extent _____	
Remarks: _____			
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of erosion
Aerial extent _____		Depth _____	
Remarks: _____			
4.	Undercutting	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
Aerial extent _____		Depth _____	
Remarks: _____			
5.	Obstructions	Type _____	<input checked="" type="checkbox"/> No obstructions
<input type="checkbox"/> Location shown on site map		Aerial extent _____	
Size _____			
Remarks: _____			
6.	Excessive Vegetative Growth	Type _____	
<input checked="" type="checkbox"/> No evidence of excessive growth			
<input type="checkbox"/> Vegetation in channels does not obstruct flow			
<input type="checkbox"/> Location shown on site map		Aerial extent _____	
Remarks: _____			
D. Cover Penetrations <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	Gas Vents	<input checked="" type="checkbox"/> Active	<input type="checkbox"/> Passive
<input checked="" type="checkbox"/> Properly secured/locked		<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> Good condition
		<input type="checkbox"/> N/A	
Remarks: _____			
2.	Gas Monitoring Probes	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning
<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> Good condition
		<input type="checkbox"/> N/A	
Remarks: <u>No longer monitors gas due to low levels.</u>			

3.	Monitoring Wells (within surface area of landfill)	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled	<input checked="" type="checkbox"/> Good condition
		<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A	
Remarks: _____					
4.	Extraction Wells Leachate	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A	
Remarks: _____					
5.	Settlement Monuments	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed	<input checked="" type="checkbox"/> N/A	
Remarks: _____					
E. Gas Collection and Treatment <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A					
1.	Gas Treatment Facilities	<input type="checkbox"/> Flaring	<input type="checkbox"/> Thermal destruction	<input type="checkbox"/> Collection for reuse	
		<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance		
Remarks: _____					
2.	Gas Collection Wells, Manifolds and Piping	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance		
Remarks: _____					
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A	
Remarks: _____					
F. Cover Drainage Layer <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A					
1.	Outlet Pipes Inspected	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A		
Remarks: _____					
2.	Outlet Rock Inspected	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A		
Remarks: _____					
G. Detention/Sedimentation Ponds <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A					
1.	Siltation	Area extent _____	Depth _____	<input checked="" type="checkbox"/> N/A	
	<input type="checkbox"/> Siltation not evident				
Remarks: _____					
2.	Erosion	Area extent _____	Depth _____		
	<input checked="" type="checkbox"/> Erosion not evident				
Remarks: _____					
3.	Outlet Works	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A		
Remarks: _____					

4.	Dam	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A
Remarks: _____			
H. Retaining Walls <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
Horizontal displacement _____		Vertical displacement _____	
Rotational displacement _____			
Remarks: _____			
2.	Degradation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
Remarks: _____			
I. Perimeter Ditches/Off-Site Discharge <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	Siltation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Siltation not evident
Area extent _____		Depth _____	
Remarks: _____			
2.	Vegetative Growth	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Vegetation does not impede flow			
Area extent _____		Type _____	
Remarks: <u>There is some vegetative growth in ditch, but does not appear to impede flow.</u>			
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
Area extent _____		Depth _____	
Remarks: _____			
4.	Discharge Structure	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A
Remarks: _____			
VIII. VERTICAL BARRIER WALLS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	Settlement	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
Area extent _____		Depth _____	
Remarks: _____			
2.	Performance Monitoring	Type of monitoring _____	
<input type="checkbox"/> Performance not monitored			
Frequency _____		<input type="checkbox"/> Evidence of breaching	
Head differential _____			
Remarks: _____			
IX. GROUNDWATER/SURFACE WATER REMEDIES <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
A. Groundwater Extraction Wells, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			

1.	Pumps, Wellhead Plumbing, and Electrical	<input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
Remarks: _____		
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance
Remarks: _____		
3.	Spare Parts and Equipment	<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided
Remarks: _____		
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Collection Structures, Pumps, and Electrical	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance
Remarks: _____		
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance
Remarks: _____		
3.	Spare Parts and Equipment	<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided
Remarks: _____		
C. Treatment System <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Treatment Train (Check components that apply) <div style="display: flex; flex-wrap: wrap;"> <div style="width: 33%;"><input type="checkbox"/> Metals removal</div> <div style="width: 33%;"><input type="checkbox"/> Oil/water separation</div> <div style="width: 33%;"><input type="checkbox"/> Bioremediation</div> <div style="width: 33%;"><input type="checkbox"/> Air stripping</div> <div style="width: 33%;"><input type="checkbox"/> Carbon adsorbers</div> <div style="width: 33%;"><input type="checkbox"/> Filters _____</div> <div style="width: 33%;"><input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____</div> <div style="width: 33%;"><input type="checkbox"/> Others _____</div> <div style="width: 33%;"><input type="checkbox"/> Good condition</div> <div style="width: 33%;"><input type="checkbox"/> Needs Maintenance</div> <div style="width: 33%;"><input type="checkbox"/> Sampling ports properly marked and functional</div> <div style="width: 33%;"><input type="checkbox"/> Sampling/maintenance log displayed and up to date</div> <div style="width: 33%;"><input type="checkbox"/> Equipment properly identified</div> <div style="width: 33%;"><input type="checkbox"/> Quantity of groundwater treated annually _____</div> <div style="width: 33%;"><input type="checkbox"/> Quantity of surface water treated annually _____</div> </div>	
Remarks: _____		

2.	Electrical Enclosures and Panels (properly rated and functional)	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance
Remarks: _____		
3.	Tanks, Vaults, Storage Vessels	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance
Remarks: _____		
4.	Discharge Structure and Appurtenances	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance
Remarks: _____		
5.	Treatment Building(s)	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored
Remarks: _____		
6.	Monitoring Wells (pump and treatment remedy)	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
Remarks: _____		
D. Monitoring Data		
1.	Monitoring Data	<input type="checkbox"/> Is routinely submitted on time <input type="checkbox"/> Is of acceptable quality
2.	Monitoring data suggests:	<input type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining
E. Monitored Natural Attenuation		
1.	Monitoring Wells (natural attenuation remedy)	<input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
Remarks: _____		
X. OTHER REMEDIES		
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.		
XI. OVERALL OBSERVATIONS		
A. Implementation of the Remedy		

<p>Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).</p> <p><u>The remedy is effective and functioning as intended by decision documents to reduce the risks associated with exposure to contaminated media to health-based levels and to protect the surficial aquifer system beyond the current site boundary.</u></p>
<p>B. Adequacy of O&M</p>
<p>Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.</p> <p><u>Monthly site inspections and routine maintenance ensure the Site is well maintained.</u></p>
<p>C. Early Indicators of Potential Remedy Problems</p>
<p>Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.</p> <p><u>None</u></p>
<p>D. Opportunities for Optimization</p>
<p>Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.</p> <p><u>The EPA, FDEP and PRPs are in discussions to reduce monitoring frequency and possibly close out the groundwater monitoring program and abandon unnecessary wells.</u></p>

Site Inspection Team:

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Kelsey Helton, FDEP, kelsey.helton@dep.state.fl.us, (850) 245-8969
Pam Scully, EPA Region 4 RPM, scully.pam@epa.gov, (404) 562-8935

Appendix E: Photographs from Site Inspection Visit



A well-marked and locked methane gas monitoring well



View of the eastern fence line surrounding the landfill



Locked rear entrance gate



The wet retention area on south side of the Site



Rock Pit Lake to the north of the Site



Part of the drainage system and vegetated cap



The cut fence along the northern boundary of the Site



Front entrance gate, locked and secured



Sign on the fence

Appendix F: Data Review

Table F-1: Summary of Historical Dioxin Fish Data (ng/kg)

Parameter/ Sample No. Date	Bass Fillet RP-FTS- 02 Dec-92	Large Bass Fillet RP- FTS-07 Dec-92	Medium Bass Fillet RP- FTS-08 Dec-92	Bass Fillet RP-FTS- 10 Dec-92	WIN- RPL- BASS- COMP Aug-02	WIN- RPL- BASS-1 Mar-03	WIN- RPL- BASS-2 Mar-03	WIN- RPL- BASS-3 Mar-03	WIN-RPL- TOPWATER- 1 Nov-03	WIN- RPL- FTS Nov-08	WIN- RPL- FTS Nov-09	WIN- RPL- FTS Nov-10	WN RPL- FT-1 Aug-13	WN RPL- FT-1 Sep-15
2,3,7,8-TCDF	0.61	0.27	0.59	0.58	ND	0.52	1.7	ND	0.45	0.57	1.7	1.5	1.1	1.2
total TCDF	0.61	0.27	0.59	0.58	ND	0.52	2.9	1.0	0.45	0.57	1.7	1.5	1.7	1.2
1,2,3,7,8- PeCDF	ND	ND	ND	ND	ND	ND	ND	2.0	1.1 E	ND	ND	ND	0.083 EIJ	0.18
2,3,4,7,8- PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.12	0.32 E
total PeCDF	ND	ND	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND	0.46 J	0.18
1,2,3,4,7,8- HxCDF	ND	ND	ND	ND	1.3 E	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,6,7,8- HxCDF	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9 E	ND	ND	ND	ND
total HxCDF	ND	ND	ND	ND	ND	ND	ND	6.2	ND	1.9 E	ND	ND	ND	0.18
1,2,3,6,7,8- HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.22 E
total HpCDF	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.200 J	ND
1,2,3,4,6,7,8- HpCDD	1.3 E, B	1.3 E, B	ND	1.2 E	ND	1.5 J	1.1 J	1.3 J	ND	ND	ND	ND	0.200 J	0.23E
total HpCDD	1.3	2.3	ND	2.6	ND	1.5	1.1	1.3 J	ND	ND	ND	ND	0.350 J	ND
OCDF	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.150 J	ND
OCDD	22.2 E, B	19.2 B	18.5 B	23.5 B	ND	21 B	8.1 B, J	12 B	2.7 BJ	ND	ND	ND	0.770 EIJ	0.79 E

B = less than 10 times higher than method blank level

J = estimated value

E = estimated maximum possible concentration

I = interference present

ND = non-detect

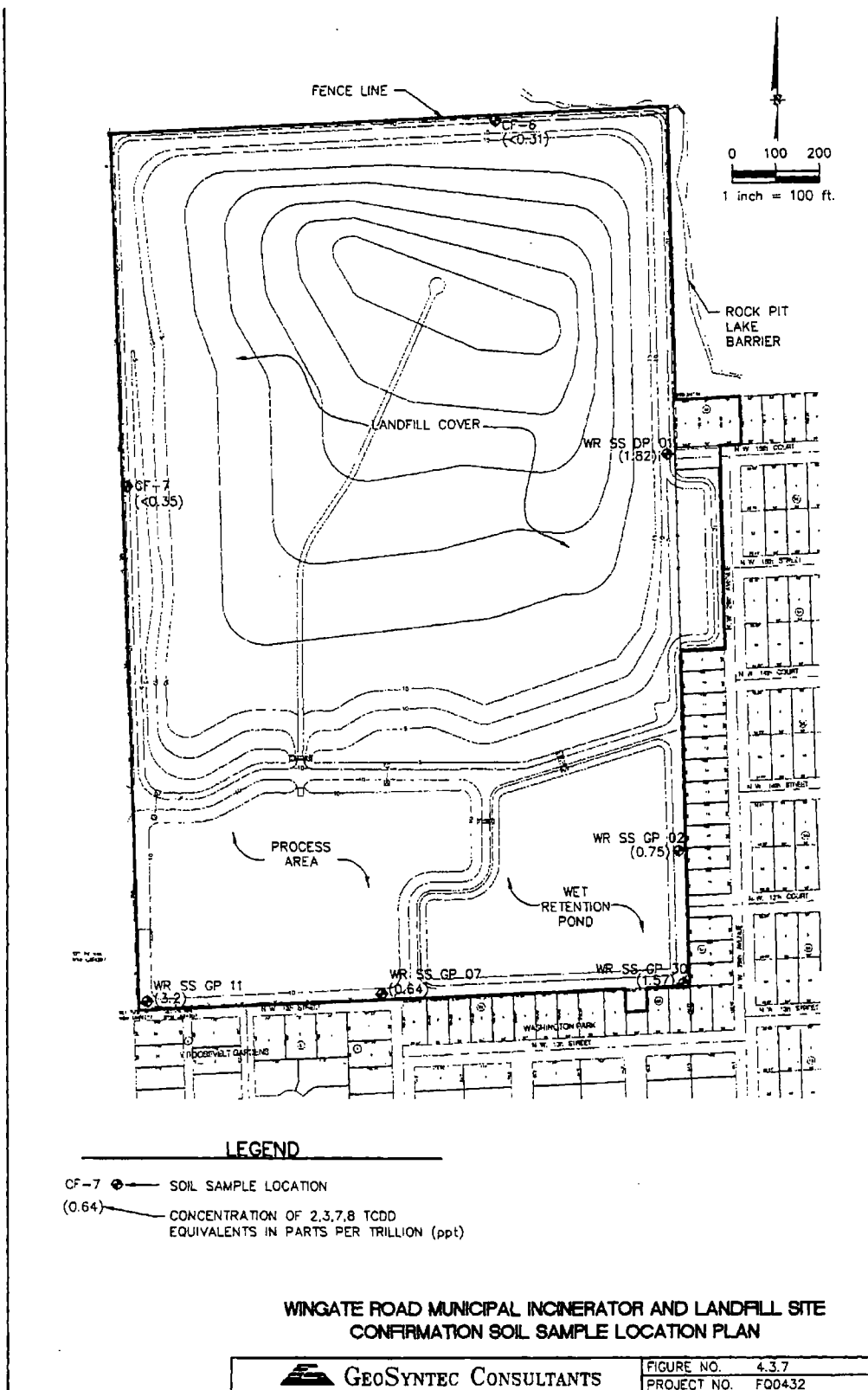
NA = not applicable

ng/kg = nanogram per kilogram

Table F-2: Summary of Total Dioxin Toxicity Equivalence (TEQ) in Fish Tissue (ng/kg)

Bass Fillet RP- FTS-02 Dec-92 TEQ	Large Bass Fillet RP- FTS-07 Dec-92 TEQ	Medium Bass Fillet RP- FTS-08 Dec-92 TEQ	Bass Fillet RP- FTS-10 Dec-92 TEQ	WIN- RPL- BASS- COMP Aug-02 TEQ	WIN- PL- BASS-1 Mar- 03 TEQ	WIN- RPL- BASS- 2 Mar-03 TEQ	WIN- RPL- BASS- 3 Mar- 03 TEQ	WIN-RPL- TOPWATER- 1 Nov-03 TEQ	WIN- RPL- FTS Nov- 08 TEQ	WIN- RPL- FTS Nov-09 TEQ	WIN- RPL- FTS Nov- 10 TEQ	WN RPL-FT-1 Aug-13 TEQ	WN FT-1 Sep-15 TEQ
Including B qualified data													
0.08066	0.05576	0.06455	0.09105	0.13	0.0733	0.30343	0.7966	0.07881	0.247	0.17	0.15	0.189576	0.167937
Excluding B qualified data													
0.061	0.037	0.059	0.084	0.13	0.067	0.301	0.793	0.078	0.247	0.17	0.15	0.189576	0.167937
TEQ concentrations calculated by multiplying each dioxin compound by its corresponding TEFs established by the World Health Organization in 2005 and summing the TEQ for each sample as follows: total TCDF x TEF of 0.1 total PeCDF x TEF of 0.03 total HxCDF x TEF of 0.1 total HpCDF x TEF of 0.01 total HpCDD x TEF of 0.01 total OCDF x TEF of 0.0003 total OCDD x TEF of 0.0003 ng/kg = nanograms per kilogram													

Figure F-1: Soil Confirmation Sampling⁶



⁶ Remedial Action Report for Wingate Road Municipal Incinerator and Landfill Site. June 2003.